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Scientific/Research and Development

**PLANNING FOR SCIENCE AND
TECHNOLOGY**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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OPR: SAF/AQT Capt Gray

Certified by: SAFAQT Col Higgins

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This instruction implements Air Force Policy Directive (AFPD) 61-1, *Management of Science and Technology (S&T)*. It provides guidance for actions required before approval of the Air Force S&T program Technology Area Plans (TAP) and Technology Investment Plans (TIP). Section 3 gives definitions of terms used in the Air Force Instruction (AFI). Send comments and suggested improvements on AF Form 847, *Recommendation for Change of Publication*, through channels, to SAF/AQT, 1060 Air Force Pentagon, Washington DC 20330-1060.

1. Responsibilities.

1.1. The Assistant Secretary of the Air Force for Acquisition (SAF/AQ):

- Provides overall management for the Air Force S&T program.
- Approves the scope of Technology Areas (TA) and their assignment among the Air Force laboratories (lab).
- Approves all TAPs.
- Approves TIPs.
- Approves all technology programs with planned contractual solicitations which based on dollar threshold require an acquisition plan.

1.2. The Director of Science and Technology, Assistant Secretary of the Air Force for Acquisition (SAF/AQT) coordinates TAPs and TIPs.

1.3. The Technology Executive Officer (TEO), Director of Science and Technology, Headquarters Air Force Materiel Command (HQ AFMC/ST):

- Gives the Air Force labs detailed guidance on how to prepare TAPs and TIPs and the supporting documentation.
- Provides AFMC coordination on TAPs and TIPs.

- Establishes and maintains the process the labs use in working with operational major commands (MAJCOM), or "users," and the AFMC product, test, and air logistics centers to ensure TAPs and TIPs address the technology needs of the acquisition, logistics, and test communities and to improve the technology transition process.
- Resolves inter-lab questions.
- Approves TIPs within his/her delegated authority.

1.4. The Air Force Lab Commanders or Directors:

- Prepare TAPs and TIPs.
- Coordinate their TAPs and TIPs with other Air Force labs.
- Approve TIPs within their delegated authority.
- Work with the operational MAJCOM ("users") and the AFMC product, test, and air logistics centers to ensure TAPs and TIPs address the technology needs of the acquisition, logistics, and test communities and to improve the technology transition process.

2. Planning, Review, and Approval.

2.1. Planning. Each lab drafts TAPs for their assigned TAs and the TIPs funded primarily from their respective lab's program elements (PE) and coordinates them with the other Air Force labs. The lab commanders or directors should maximize stability in TAP technical content from year to year while also accommodating fact-of-life technological changes. Each lab should propose TAPs and TIPs that include an appropriate mix in advanced development (expected to vary with time and TA) of critical experiments (CE) and technology demonstrations (TD).

2.2. Review:

2.2.1. MAJCOMs review advanced development efforts for relevancy to future technology needs.

2.2.1.1. Each lab provides written descriptions of proposed TDs and selected CEs to HQ AFMC/ST.

2.2.1.2. HQ AFMC/ST sends the descriptions to the user MAJCOMs.

2.2.1.3. The MAJCOMs rank all relevant proposed TDs and may rank selected CEs for relevancy to future technology needs. The MAJCOMs send their rankings to HQ AFMC/ST.

2.2.1.4. HQ AFMC/ST consolidates individual MAJCOM rankings into a single ranking.

2.2.2. The Air Force Scientific Advisory Board (SAB) and other technical expert review groups review the TAPs for technical quality in parallel with the approval process.

2.2.2.1. Each lab presents assigned TAPs to the SAB and other external technical expert review groups as directed.

2.2.2.2. The SAB sends SAF/AQ a report on technical quality of the efforts described in the TAPs.

2.3. TAP Approval. Labs submit TAPs to HQ AFMC/ST after coordination with other Air Force labs.

2.3.1. The TEO, HQ AFMC/ST, coordinates the TAPs and sends them to SAF/AQT for their coordination and for SAF/AQ approval.

2.3.2. **Table 1.** provides the schedule for TAP processing.

2.3.3. SAF/AQT reviews the TAPs and notifies HQ AFMC/ST of issues that need to be resolved before TAP approval. SAF/AQT provides the TAPs to SAF/AQ for approval.

2.3.4. After SAF/AQ approves the TAPs, HQ AFMC/ST publishes them.

2.3.5. Once SAF/AQ approves the Research TAP, the labs may award basic research contracts or grants.

Table 1. TAP Processing Milestones.

	Schedule
- Submit TAP to SAF/AQT	No later than 1 Apr
- SAF/AQT notifies HQ AFMC/ST of TAP issues	2 weeks after submittal
- TAP approval, approval with exception, or disapproval	1 May

2.4. TIP Approval. SAF/AQ has delegated TIP approval authority to AFMC/ST as detailed below.

2.4.1. Labs submit all TIPs beyond their approval authority with supporting documentation to HQ AFMC/ST. HQ AFMC/ST coordinates the TIPs and submits them with their supporting documents to SAF/AQT for coordination and SAF/AQ approval.

2.4.2. TIPs submitted according to the schedule in **Table 2.** are "in-cycle." Supporting documentation for in-cycle TIPs includes:

- Level 2 Roadmaps (see paragraph 3.5).
- Financial Summaries.
- Include informational copies of acquisition investment plans (AIP) with the in-cycle TIP submission.

2.4.3. TIPs submitted at other times are "out-of-cycle." Supporting documentation for out-of-cycle TIPs includes updated Level 2 Roadmaps.

2.4.4. SAF/AQ approves the obligation of Air Force S&T project funds for:

- All in-cycle TIPs that have a planned total value of \$1 million or more.
- All out-of-cycle TIPs.
- All changes to previously approved TIPs that increase either the total value in an individual PE by 10 percent or the total value of the TIP by \$1 million.

2.4.5. AFMC/ST approves the obligation of Air Force S&T project funds for all in-cycle TIPs that have planned total value of less than \$1 million. At AFMC/ST discretion, this approval authority may be delegated to lab commanders or directors. Lab commanders or directors may not further delegate this authority.

2.4.6. SAF/AQ acts on out-of-cycle TIPs or requested changes to TIPs within 30 days of receipt.

2.4.6.1. Lab commanders or directors submit out-of-cycle only those TIPs that are essential because of unanticipated technical or fiscal changes.

2.4.7. Lab commanders or directors approve their in-cycle TIPs that have a planned total value of less than \$1 million. They may approve these TIPs only after coordinating with all other Air Force lab commanders or directors.

2.4.8. The lab commander or director approves changes to TIPs that increase the total value by less than the amount requiring SAF/AQ approval, as defined in paragraph 2.4.4.

Table 2. In-cycle TIP Approval Milestones.

	Schedule
- Submit TIPs to SAF/AQT for coordination and SAF/AQ approval	No later than 1 Aug
- SAF/AQT notifies HQ AFMC/ST of TIP issues - Labs Release request for proposals (RFP) for TIPs with no issues	4 weeks after submittal
- TIP approval, approval with exception, or disapproval	1 Oct or 1 week after Appropriations Bill signed

CLARK G. FIESTER
The Assistant Secretary of the Air Force for Acquisition

Attachment 1

GLOSSARY OF REFERENCES, ABBREVIATIONS, ACRONYMS, AND TERMS

References

AFPD 61-1, *Management of Science and Technology (S&T)*

Abbreviations and Acronyms

AIP—Acquisition Investment Plan

CE—Critical Experiment

FYDP—Future Years Defense Plan

lab—Laboratory

MAJCOM—Major Command

MIPR—Military Interdepartmental Purchase Request

PE—Program Element

RFP—Request for Proposals

S&T—Science and Technology

SAB—Scientific Advisory Board

TA—Technology Area

TAP—Technology Area Plan

TD—Technology Demonstration

TTP—Technology Transition Plan

TEO—Technology Executive Officer

TIP—Technology Investment Plan

Terms

Acquisition Investment Plan (AIP)—An AIP provides an overview of a planned contractual solicitation that, based on dollar threshold, requires SAF/AQ approval of an acquisition plan. Prepare an AIP in the same format as a TIP.

Critical Experiment (CE)—A CE is an advanced development effort that attempts to advance a concept or technology beyond the exploratory development phase into component testing in a laboratory environment. It can be a simulation or the initial phase of a technology demonstration and can include concept studies. TIPs are the basis for CE approval.

Financial Summary—The Financial Summary is a table that provides all the funding in the current year and future years defense plan (FYDP) by PE and project both at the thrust and at the subthrust level in the TAP.

Level 1 Roadmap—The Level 1 Roadmap provides a graphical overview by fiscal year of the major

ongoing and planned S&T-funded efforts in a TA thrust. It includes major milestones for the thrust.

Level 2 Roadmap—The Level 2 Roadmap provides a detailed graphical representation by fiscal year of all the S&T-funded efforts in a TA subthrust and includes for each effort:

- The current year and FYDP funding by PE and project.
- The TIP number.
- The major milestones.
- The interrelationships between efforts.

The Level 2 Roadmap also includes a written description of the TAP subthrust and it identifies all other efforts that significantly contribute to or benefit from the S&T-funded efforts in the subthrust.

Technology Area (TA)—A TA is a specific portion of the Air Force S&T program and is the fundamental building block of the program. TAs are subdivided into thrusts and subthrusts. For example, the Aero Propulsion and Power TA includes two thrusts:

- Turbine engines.
- Fuels and lubricants.

Turbine engine subthrusts include:

- Turbofan and turbojet engines.
- Expendable engines (as for cruise missiles).

Technology Area Plan (TAP)—The TAP is a key planning and advocacy document for the Air Force S&T program. The TAPs represent a strategic plan for satisfying future war fighting technology needs. The complete set of TAPs documents the Air Force S&T program. Each TAP documents the objectives, approach, program plans, and resources to develop and demonstrate technology in a TA. The TAP includes:

- A statement of vision.
- An introduction, including relevant funding information and relationships to other technology programs.
- Descriptions of thrusts and their anticipated benefits.
- A Level 1 Roadmap for each thrust.

Technology Demonstration (TD)—A TD is a fully funded advanced development effort. It seeks to meet operational MAJCOM ("user") technology needs through "proof of principle" demonstrations in an operationally realistic environment and to reduce risk for a follow-on acquisition program. A TD lasts a maximum of 5 years, its value is generally between \$5 and \$100 million, and participants in the demonstration include the user or AFMC system program office (SPO). The user and AFMC SPO sign the technology transition plan (TTP). TTPs are the basis for TD approval.

Technology Investment Plan (TIP)—A TIP is the planning and approval document for a contractual solicitation or external (non-in-house) effort (for example, Military Interdepartmental Purchase Request [MIPR] or project order) that:

- Is totally or partially funded by exploratory development or advanced development PEs in the Air Force S&T program.
- Has a total anticipated value below that requiring SAF/AQ approval of an acquisition plan.

The TIP includes:

- Title and number.
- Preparation date.
- Name and telephone of lab office of primary responsibility (OPR).
- Planned funding, by PE and project.
- Cross reference to Level 2 Roadmaps.
- Relevant background information to include rationale, related work, and coordination.
- Technical objectives and approach.
- Programmatic approach.
- Contracting method and milestones.

Technology Transition Plan (TTP)—A TTP documents the specific tasks and achievements required to demonstrate that the risk associated with a technology transition is within acceptable bounds. It is an agreement between the lab; the operational MAJCOM; and the product, test, or air logistics center.